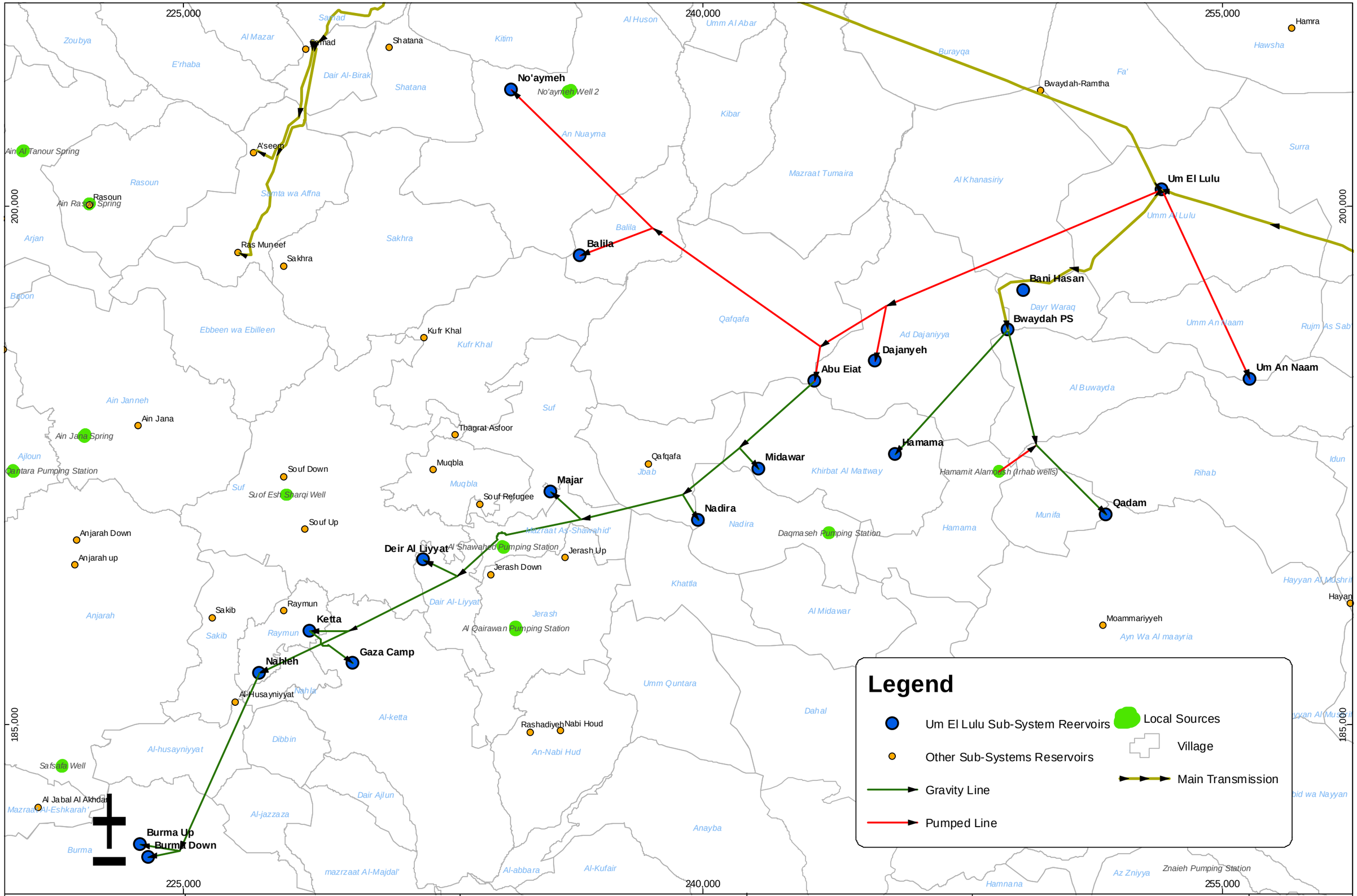


DRAWING SCALE: 1:100,000	THE HASHEMITE KINGDOM OF JORDAN MINISTRY OF WATER AND IRRIGATION WATER AUTHORITY	CDM International Inc.	NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY Final Proposed System: Um El-Lulu Sub-Systems Plan	PROJECT No. : 3029-42324 FIGURE No. 8-7

1000
950
900
850
800
750
700
650

Abu Eiat

Emergency Connection from Qafqafa

Nadira

Dajanyeh

Balila

Majar

Delr Llyyat

Nahleh

Midwar

Ketta

No'aymeh Down

Burma Up

Burma Down

Gaza Refugee Camp

From Ain Al Deek spring

No'aymeh Well

Elevation - Typical

Dodmosseh PS

Rhab Well & PS

Qadam

Bwaydah

Hamama

Bani Hasan

Elevation - Typical

To Hofa

From Zatary PS

Um An Naam

Um El Lulu

Elevation - Typical

Um El-Lulu PS

Legend

- Flow Meter
- Pump
- Control Valve
- Reservoir
- Well (Well Name)
- Transmission Line Pumped
- Transmission Line Gravity
- Transmission Line Emergency
- Spring
- Local Pipe
- Sub-System Boundary
- WTP — Water Treatment Plant

NOT TO SCALE	THE HASHEMITE KINGDOM OF JORDAN MINISTRY OF WATER AND IRRIGATION WATER AUTHORITY		CDM International Inc.	NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY SCHEMATIC PROFILE OF PROPOSED SYSTEM UM EL-LULU SUB-SYSTEM	PROJECT NO. 3029-42324 FIGURE NO. 8-8

8.2.3 West Transmission

The main water sources in the west are:

- Tabaqat Fahel wells (Wells 1, 3, 6, 8, and spring 9) (675 m^3/h)
- Wadi Al Arab Wells (Wells 1, 2, 3, 4, 5, 7) (1525 m^3/h)
- Wehdeh Dam (4110 m^3/h)

Major local sources within the west transmission system include:

- Oyoon Al Hammam wells (325 m^3/h)
- Juhfiyya wells (171 m^3/h)
- Jaber wells (360 m^3/h)
- Hakama wells (199 m^3/h)
- Judyta and Beit Idis wells (162m^3/h)
- Ain Al Tanour (112 m^3/h)
- Zuqaq wells (172 m^3/h)

West Primary Transmission System. The West transmission system includes the Tabaqat Fahel system and the Wadi Arab system, which in turn serve three subsystems designated as Deir As Sina, Hofa, and Wehdeh. The Wadi Al Arab system receives water from the Tabaqat Fahel wells, which currently discharge at Elevation -72m and deliver 675 m^3/h by gravity to Wadi Al Arab PS0 at -190m through a 600mm existing pipe. A new set of booster pumps at PS0 is proposed to boost the Tabaqat Fahel water into the force main from PS0 to PS1; this will save about 100m in pumping head, compared to the existing system. The 600m3/h of water coming from the proposed KAC WTP is stored at the existing PS0 and then pumped to PS1 with Tabaqat Fahel water boosted at PS0 through the existing 600mm pipeline to PS1, where it is mixed with the water from the Wadi Al Arab Water Treatment Plant. The 100 m3/h of water currently taken from Manshiyeh wells is of poor quality, and is therefore directed to the KAC as a trade for an additional 100 m3/h of treated water from the new KAC WTP.

The Wadi Al Arab water treated in the existing treatment plant at PS1, and that by-passing it coming from PS0, are pumped together in the existing 800mm pipeline to Wadi Al-Arab PS2 and then to PS3, thereby making use of the existing pump stations and pipelines. PS3 pumps water in four directions one towards Zubdat reservoir and three towards Deir As Sina subsystem. Zubdat reservoir receives water from the Wehdeh system as well. Zubdat PS pumps water to Hofa reservoir.

The three proposed western sub-systems are described below.

Deir As Sina Subsystem: (See plan and schematic profile on **Figures 8-9 and 8-10** respectively). This sub-system is fed from several new sets of pumps located at the existing Wadi Al Arab PS3. It serves regions in Al Koura, a few regions in Irbid, and the western parts of Ajloun having elevations lower than 860m. At present, Al Koura mainly depends on local sources such as Oyoon Al Hamam and Judyta wells, whilst Ajloun is served by local sources and Ras Muneef Reservoir.

Four new branches will exit from Wadi Al Arab PS3, three of which are pumped; the fourth is a gravity line which will carry water to Mindah reservoir which also has its own local source (Al Taybeh Wells).

The first pressurized line is directed towards Al Taybeh and Qumaym reservoir where a new PS is suggested to pump the water to Soum reservoir which also has its own local sources (Kufr Youba and Dougara wells). The second serves Deir As Sina reservoir. The third branch is directed towards the south of Al Koura to feed Jinnin which itself pumps to Ezimal. The branch by-passes Jinnin and continues onward to serve Kufr Alma reservoir where a new pump station is suggested. Kufr Alma pump station also gets the remaining water from Oyoon Al Hamam local source through the Kufr Alma line (after feeding Tubneh and Deir Abi Said reservoirs) to feed Ashrafiyya and Kufr Awan reservoirs in Al Koura. The pipe line from Al Koura carries on to serve the western parts of Ajloun by two boosters with additional supplies from Judyta and Beit Idis wells (after feeding Judyta Down reservoir), the first located before Al Wahadneh crossing, and the second at the Zuqaq PS3 location, thereby serving Al Hashimiyya, Deir Smadiyyeh and Kofranjeh Down reservoirs.

The other local sources that feed the Deir As Sina subsystem include:
Zuqaq spring (Zuqaq PS1) feeds Al Hashimiyya reservoir, Halawa well feeds Deir As Sina transmission pipeline.

The advantages of this sub-system are to make sure that Al Koura is receiving its total demand in 2030 from the transmission system, when the local sources are expected not to be sufficient. The water will no longer have to be pumped up to Ras Muneef (at 1190m) and then passed to lower elevations by gravity flow; the Deir As Sina system will save energy and reduce pipe length. Wadi Al Arab PS3 was selected as the water source for this subsystem, instead of Zubdat or Ras Muneef PS, for the same reasons: to reduce energy consumption and pipe length.

Hofa Subsystem: (See plan and schematic profile on **Figures 8-11, and 8-12** respectively). This sub-system includes the main pumping stations of Hofa and Samad. Hofa PS is served by Zatary PS from the East.

Hofa PS, which lies on the boundary between the eastern and western systems, feeds areas in Irbid Governorate as follows:

- By gravity, it serves three reservoirs: Ham / Beit Yafa by one pipeline and Sarih by another one.
- Two pressurized pipelines feed the Juhfiyya, Habka and Huson reservoirs.
- Another pressurized main serves Samad PS.

Samad PS starts off its own network as follows:

- One line by gravity serves Shatana reservoirs.
- Two pressurized lines serve A'seem and Ras Muneef reservoirs.

A'seem reservoir receives 670 m3/h flow from Samad PS, and by gravity supplies a first group of Ajloun reservoirs: Rasoun, Ishtafina, Ajloun, Ain Jana, Anjarah Down, and Kofranjeh Up and Judyta Up reservoir in Al Koura. Some of these reservoirs are also partly served by local sources. A second group of Ajloun reservoirs - Anjarah Up, Rajib, Al Jabal Al Akhdar and Hooneh reservoirs - are fed from the Ras Muneef to Jerash transmission pipeline. Mazraat Eshkarah reservoir is fed totally from Safsafa well.

A few reservoirs in this subsystem are fed totally from local sources. These include Kufr Kifya and Al Mazar reservoirs, which are fed by the Juhfiyya local source that feeds Habka reservoir partially. Similarly, Arjan and Ba'oon are served from Ain Al Tanour spring.

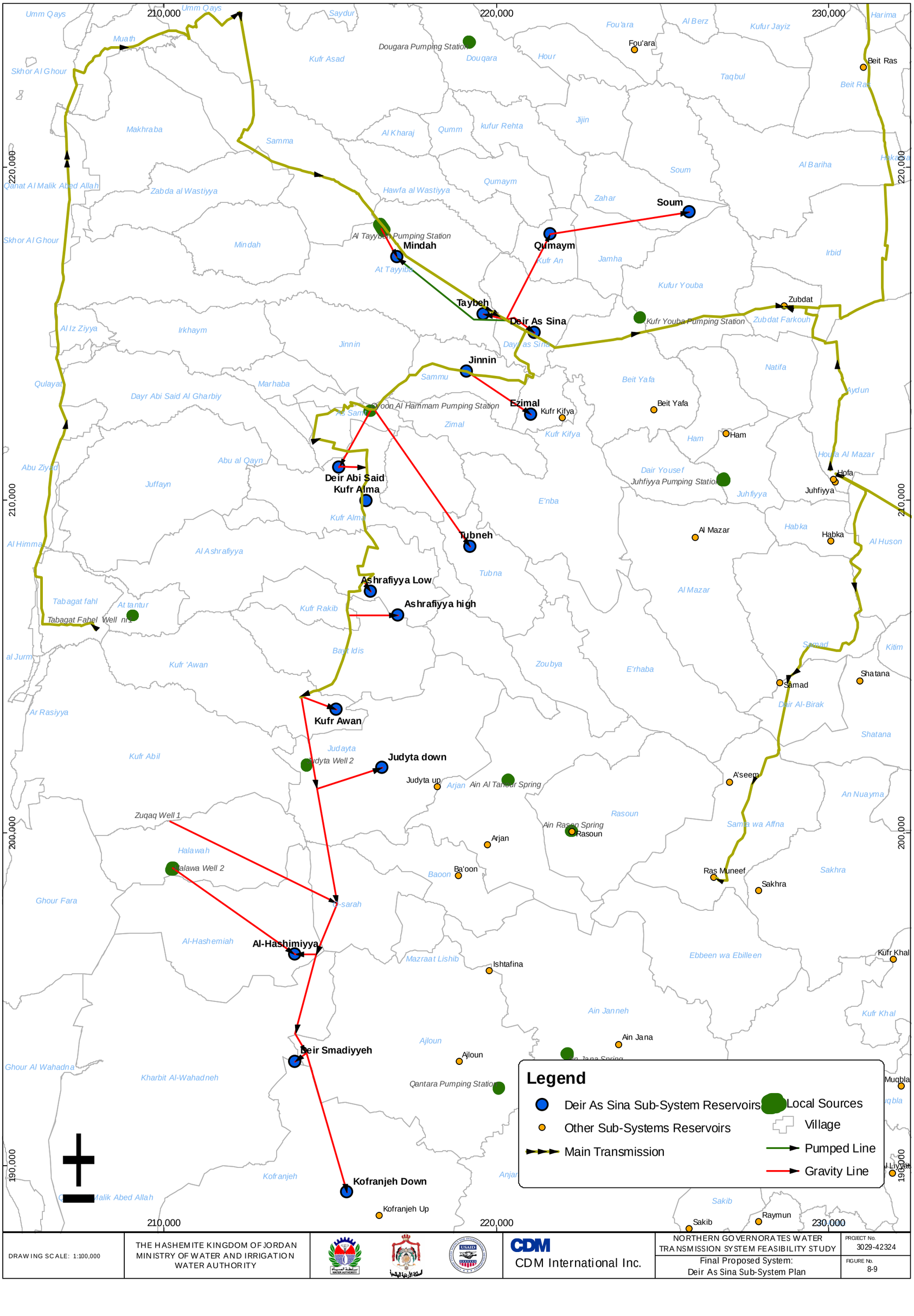
Ras Muneef reservoir, similarly, becomes responsible for its own network. It serves by gravity the high areas of Jerash through the Souf Up, Muqbla, Thagrat Asfoor, Qafqafa, Souf Down, Raymun and Sakib reservoirs. The latter reservoir serves by gravity Al Husayniyyat.

A separate branch coming out of Ras Muneef reservoir is responsible for serving Sakhra reservoir which itself feeds Kufr Khal reservoir in Jerash governorate.

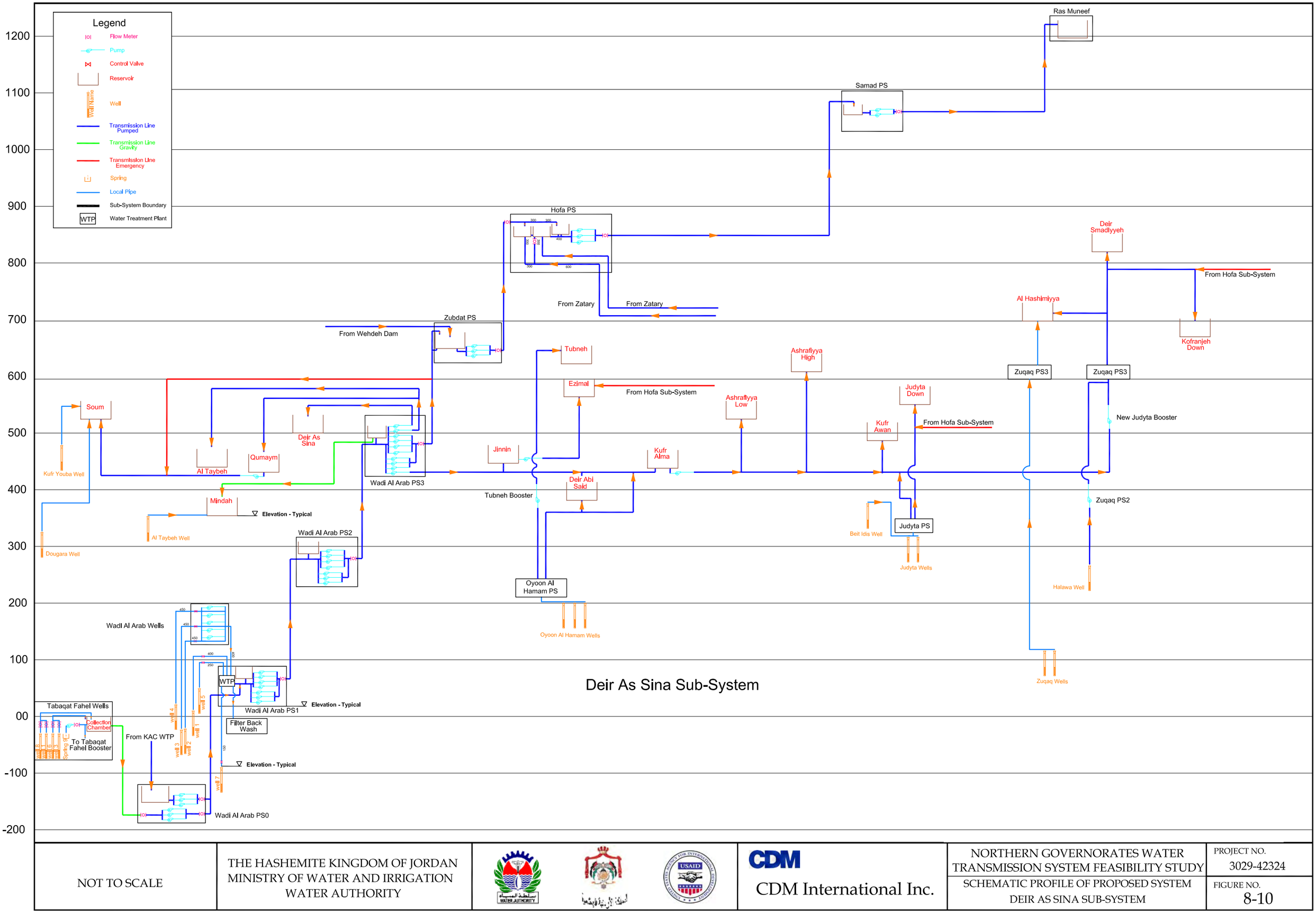
Wehdeh Subsystem: (See plan and schematic profile on **Figures 8-13 and 8-14** respectively). This sub-system is dependent on the flow expected from the Wehdeh Dam. A pipeline for conveying this flow from the Dam, a treatment plant, and three pump stations (named Wehdeh PS0, PS1 and PS2) are to be constructed. For a detailed description of the Wehdeh Dam proposed pipelines and pumping stations refer to Appendix K.

Wehdeh PS2 pumps the water in two directions, to Zubdat Reservoir and to Bani Kinana. The pipeline to Zubdat reservoir branches out in two directions: The first towards Beit Ras and Foua'ra; and the second branch (before the pipeline reaches its destination at Zubdat reservoir) supplies Sal, Ramtha City, Al Toura, Ash Shajara, and Amrawa/Thunayba reservoirs. Local sources also feed this area such as Hakama, Rahoub, Harima, Jabir, Al Mahasi and Al Toura wells.

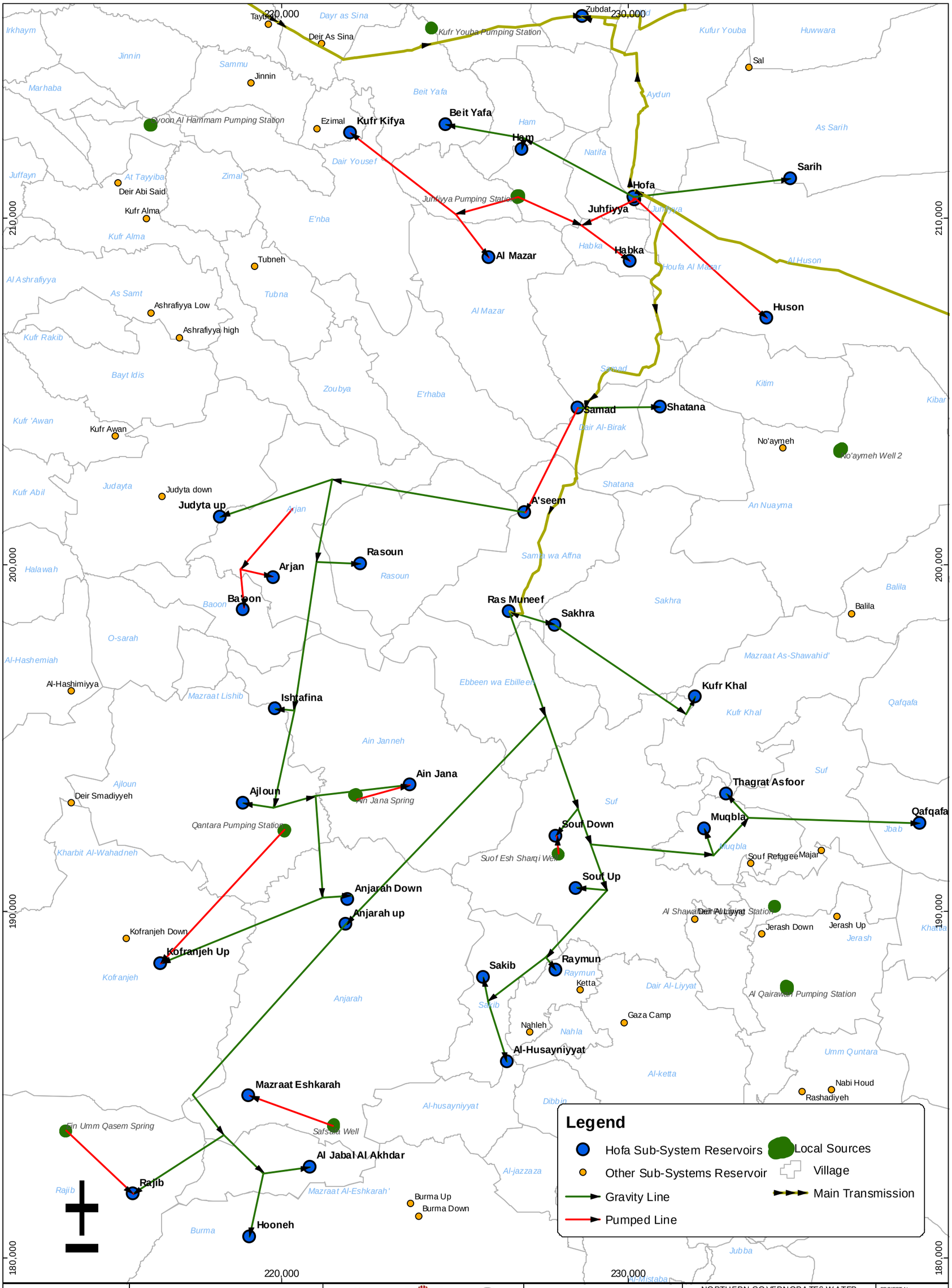
Wehdeh PS2 also pumps water in the direction of Bani Kinana. It reaches Sama Ar Rousan reservoir, where water is sent by gravity to Abder reservoir in another pipeline.



DRAWING SCALE: 1:100,000	THE HASHEMITE KINGDOM OF JORDAN MINISTRY OF WATER AND IRRIGATION WATER AUTHORITY	CDM International Inc.	NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY Final Proposed System: Deir As Sina Sub-System Plan	PROJECT No. 3029-42324 FIGURE No. 8-9



NOT TO SCALE	THE HASHEMITE KINGDOM OF JORDAN MINISTRY OF WATER AND IRRIGATION WATER AUTHORITY		CDM International Inc.	NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY SCHEMATIC PROFILE OF PROPOSED SYSTEM DEIR AS SINA SUB-SYSTEM	PROJECT NO. 3029-42324 FIGURE NO. 8-10



DRAWING SCALE: 1:300,000	THE HASHEMITE KINGDOM OF JORDAN MINISTRY OF WATER AND IRRIGATION WATER AUTHORITY		CDM CDM International Inc.	NORTHERN GOVERNORATES WATER TRANSMISSION SYSTEM FEASIBILITY STUDY Final Proposed System: Hofa Sub-Systems Plan	PROJECT No. 3029-42324 FIGURE No. 8-11